



Topics of Discussion for Technical Goliad Aquifer Exemption Meeting

Stacey Dwyer to: Harry Anthony, charles.maguire, brent.wade 08/14/2012 11:25 AM
Cc: Andy Barrett, William Honker, Wren Stenger, Philip Dellinger, David Gillespie

From: Stacey Dwyer/R6/USEPA/US
To: Harry Anthony <hanthony@uraniumenergy.com>, charles.maguire@tceq.texas.gov, brent.wade@tceq.texas.gov
Cc: Andy Barrett <Andy@thebarrettfirm.com>, William Honker/R6/USEPA/US@EPA, Wren Stenger/R6/USEPA/US@EPA, Philip Dellinger/R6/USEPA/US@EPA, David Gillespie/R6/USEPA/US@EPA



GoliadAquiferExemptionMeetingAgenda 2012 August 16 final.docx ----- EPA Topics of Discussion

Harry and Charles,

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Simulated Travel Paths08032012_00000.pdf



UEC Pump Tests 08022012_00000.pdf



Aug. 6, 2012 EPA Presentation.doc

Let me know if you have questions.

Thank you,

Stacey B. Dwyer, P.E.
Associate Director
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U.S. EPA Region 6
214-665-6729 phone
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Wren Stenger- Acting Deputy Division Director, Water Quality

Stacey Dwyer- Associate Director, Source Water Protection Branch

David Gillespie- Assistant Regional Counsel

Philip Dellinger- Chief, UIC/GW Section

Ray Leissner- Engineer

00607.pdf

Scott Ellinger- Hydrologist

TCEQ

Charles Maguire- Director, Radioactive Materials

UEC

Harry Anthony- Chief Operating Officer

Kennon Goldman- Counsel for UEC

Andy Barrett- Counsel for UEC

Van Kelly- Technical consultant

Craig Holmes - Technical consultant

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Topic: Goliad Aquifer Technical Discussion

Date: August 16, 2012 from 1-2:30 p.m.

Goal of meeting: Discussion of available data that would help EPA in determining if water wells are currently being used as a source of drinking water.

Attendees: TCEQ, UEC, EPA, Goliad County, Goliad County Groundwater Conservation District

Topic	UEC Data	EPA	Questions for Discussion
2 church wells and Braquet well – are they hydrologically connected to other sands?	Pump Tests	<p>Pump test results were used to show isolation of the A and B sands.</p> <p>However, only two monitoring well results were used to arrive at this conclusion.</p>	<p>Q: There is a fault that runs south of the proposed AE. What is the rationale for extrapolating the results of pump tests across the entire area and assuming that there will be isolation of sands near the church wells considering there is a fault?</p> <p>Q: What data exists to show isolation of the sands considering faults and artificial penetrations in the area?</p> <p>Q: Are there other pump tests or other data that address the connectivity of the A and B sands closer to the water wells?</p>
“Hypothetical well” up gradient of AE	Capture Model	UEC calculated that the capture zone of a “hypothetical” well located up gradient of the AE would only have a capture zone of 16 feet.	<p>Q: What were the assumptions used in the model?</p> <p>Q: What are the ranges of the data values used in the capture zone?</p> <p>Q: How sensitive are the results to changes?</p>
Direction of groundwater movement		Groundwater Gradient data seems inconclusive	Q: Are there other data that address direction of groundwater flow out of the areas of the sands proposed for exemption?



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GROUNDWATER QUALITY

EPA Presentation

8-6-12

Name	Grid #	Well location: GPS	Testing Entity	Laboratory Used	Date Tested	Well Depth	Chloride	Sulfate	Nitrate	TDS	Artesic	Iron	Selenium	Uranium	Gross Alpha	Radium 226	Radon 222 from Bacteria
Arden, T	14	28 52.57N 97 21.741W	GGGCD	SARA	12/16/2006	300	129	42		562	0.001	ND	0.005	0.0032	7-4-7	ND	378-4149
Arden, T	14	28 52.57N 97 21.741W	UEC	Jordan Labs	12/18/2006	300	131	38	2	600	0.001	<0.1	0.002	0.003	0	7-4-1	
Arden, T	14	28 52.57N 97 21.741W	GGGCD	B Environmental	4/26/2007	300	132	47	1.2	487	<02	<0.1	<03				
Arden, T	14	House Water Filter	GGGCD	B Environmental	4/26/2007						<05	5.55	<03				
Arden, T	14	28 52.57N 97 21.741W	GGGCD	San Antonio TL	10/10/2007												<7
Arden, T	14	28 52.57N 97 21.741W	GGGCD	SARA	12/02/2009		133	33.7	1.72	575	ND	ND	0.002	0.0033	1.3-42.3	39-4-17	279-460.3
Arden, T	14	28 52.57N 97 21.741W	GGGCD	SARA	12/10/2009		127	37.7	1.59	566	ND	ND	0.002	0.0032	3.8-42.4	16-4-14	180-473
Arden, T	14	28 52.57N 97 21.741W	GGGCD	SARA	10/26/2010		127	40.3	1.67	565	0.001	0.06	0.002	0.0034	1.7-42.5	11-4-12	244-458.9
Arden, T	14	28 52.57N 97 21.741W	GGGCD	SARA	11/16/2011		132	38.2	1.73	554	ND	ND	0.003	0.0031	(1)5-43.6	26-4-13	380-4104
Bunker, O	14	28 51.81N 97 19.802W	GGGCD	SARA	12/19/2006	122	34	21		483	0.007		0.004	0.0016	5.4-4.7	ND	372-4147
Bunker, O	14	28 51.81N 97 19.802W	UEC	Jordan Labs	12/19/2006	122	40	19	2.7	455	0.007	0.01	0.001	0.002		3-4-1	
Bunker, O	14	28 51.81N 97 19.802W	GGGCD	SARA	12/12/2009	122	35.5	16.6	3.37	480	0.008	ND	0.002	0.0014	(1)8-41.9	12-4-14	317-450.4
Bunker, O	14	28 51.81N 97 19.802W	GGGCD	SARA	12/10/2009	122	38.2	14.1	3.55	464	0.007	ND	0.002	0.0013	(1)5-41.6	(1)006-4-12	200-457
Bunker, O	14	28 51.81N 97 19.802W	GGGCD	SARA	10/26/2010	122	33.4	16.8	2.6	455	0.007	ND	0.003	0.0014	(1)3-41.8	(1)07-4-08	400-459.3
Bunker, O	14	28 51.81N 97 19.802W	GGGCD	SARA	11/16/2011	122	36	13.4	3.16	459	0.007	ND	0.002	0.0012	(1)-43.1	01-4-08	484-4104
Bunker, O	14	585 Bunker Road	UEC	Jordan Labs	12/20/2006 old well		56	15	4.9	520	0.006	0.06	0.002	0.001		7-4-1	
Deersack, C	14	28 52.53N 97 21.118W	GGGCD	Energy Labs	10/27/2006	50	202	68		830	0.002	0.04	0.006	0.0039	10.4-4.6	2-4-3	241-482.2
Deersack, C	14	28 52.53N 97 21.118W	UEC	Jordan Labs	12/15/2006	50	206	72	21	857	0.002	<0.1	0.004	0.002		3-4-1	
Deersack, C	14	28 52.52N 97 21.114W	UEC	Jordan Labs	12/15/2006	130	95	27	11	630	0.003	<0.1	0.002	0.005		3-4-1	
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	SARA	12/15/2006	130	126	27		600	0.003	ND	0.004	0.0045	3.7-4.5	4-4-3	1558-458.1
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	B Environmental	4/26/2007	130	110	42		527	<02	<0.1	<03				
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	San Antonio TL	10/10/2007	130											
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	B Environmental	12/02/2006	130	273	83.2		607	<0.1	<0.1	<02				9000
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	SARA	12/02/2009	130	88	36.5	6	627	0.003	ND	0.004	0.0046	4.5-42.9	17-4-14	197-459.4
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	SARA	12/10/2009	130	76.3	36.5	3.98	643	0.003	ND	0.004	0.0054	5.2-42.8	1-4-13	200-472
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	SARA	10/26/2010	130	66.8	23.2	4.95	615	0.004	ND	0.003	0.0052	5-42.9	24-4-14	164-455.7
Deersack, C	14	28 52.52N 97 21.114W	GGGCD	SARA	11/16/2011	130	76.7	29.8	5.85	613	0.003	ND	0.005	0.0052	3-4-4.4	24-4-13	202-4102

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Name	Grid #	Well Location: GPS	Testing Entity	Laboratory Used	Date Tested	Well Depth	Chloride	Sulfate	Nitrate	TDS	Amesic	Iron	Selenium	Uranium	Gross Alpha	Radium 226	Radon 222	Iron Bacteria
Long T	14	28 51.508N 97 21.716W	GGCDD	SARA	12/18/2006	120	165	58		684	0.002		0.002	0.0038	8+-7	7+-3	500+-154	
Long T	14	28 51.508N 97 21.716W	UEC	Jordan Labs	12/18/2006	120	173	55	0.6	646	0.002	<01	0.001	0.003		1.1+-1		
Long T	14	28 51.508N 97 21.716W	GGCDD	B Environmental	4/28/2007	120	158	64	0.7	526	<02	<01	<03					
Long T	14	28 51.508N 97 21.716W	GGCDD	San Antonio TL	10/10/2007	120												<1
Long T	14	28 51.508N 97 21.716W	GGCDD	B Environmental	3/31/2008	120	172	55.1	0.65	683	<01	0.02	<02	0.0034	14.7+-2.5	7+-2	545+-57.6	
Long T	14	28 51.508N 97 21.716W	GGCDD	SARA	12/20/2009	120	175	55.7	0.451	674	0.002	ND	0.003	0.0032	3.8+-2.7	84+-23	536+-62.8	
Long T	14	28 51.508N 97 21.716W	GGCDD	SARA	12/18/2009	120	133	54.5	0.476	655	0.002	ND	0.002	0.0034	7.1+-2.9	1+-18	610+-389	
Long T	14	28 51.508N 97 21.716W	GGCDD	SARA	10/26/2010	120	170	58.6	0.487	667	0.003	ND	0.002	0.0037	7.3+-3	1.3+-24	584+-61.4	
Long T	14	28 51.508N 97 21.716W	GGCDD	SARA	11/15/2011	120	172	54.1	0.503	655	0.002	ND	0.003	0.0032	4.5+-4.5	1.3+-23	857+-110	
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	SARA	10/27/2006	80	108	27	2.73	958	0.006	ND	0.006	0.0034	6.2+-5	4+-3	114+-60.7	
St. Peter's Church	14	28 51.474N 97 20.707W	UEC	Jordan Labs	12/20/2006	80	124	27	3	751	0.006	0.03	0.004	0.003		2+-1		
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	Energy Labs	2/13/2007	80	118	29	2.9	708	0.01		0.007	0.0033	5.3+-4	ND	170+-43.3	
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	B Environmental	3/31/2006	80	151	26	3.63	748	<01	<01	<02	0.0031	4.6+-1.1	(3)05+-08	188+-63	
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	SARA	11/20/2009	80	138	25.9	3.8	254	0.006	ND	0.005	0.0029	4.9+-3.5	(-1)05+-11	191+-57.5	
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	SARA	12/10/2009	80	170	25.3	3.66	734	0.006	ND	0.005	0.003	3+-2.7	05+-07	180+-69	
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	SARA	10/26/2010	80	113	25.3	3.98	732	0.006	0.03	0.005	0.003	7+-3	0(3)1+-07	242+-58	
St. Peter's Church	14	28 51.474N 97 20.707W	GGCDD	SARA	11/15/2011	80	103	23.9	3.58	698	0.006	ND	0.008	0.0028	(-3)4+-4.4	03+-06	253+-102	
St. Peter's Church	14	28 51.478N 97 20.708W	UEC	Jordan Labs	12/20/2006	95	474	184	10	1510	0.002	<01	0.005	0.003		2+-1		



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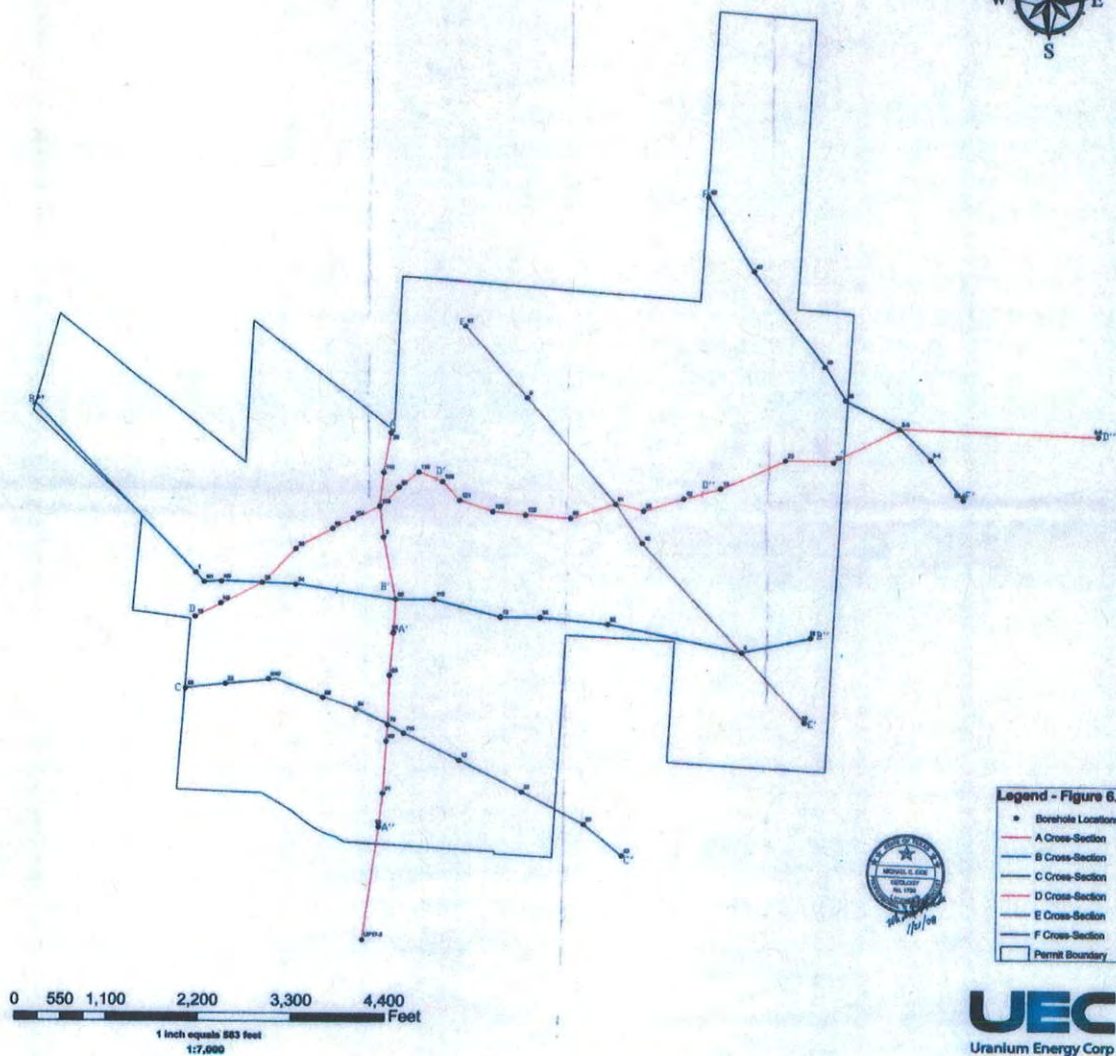
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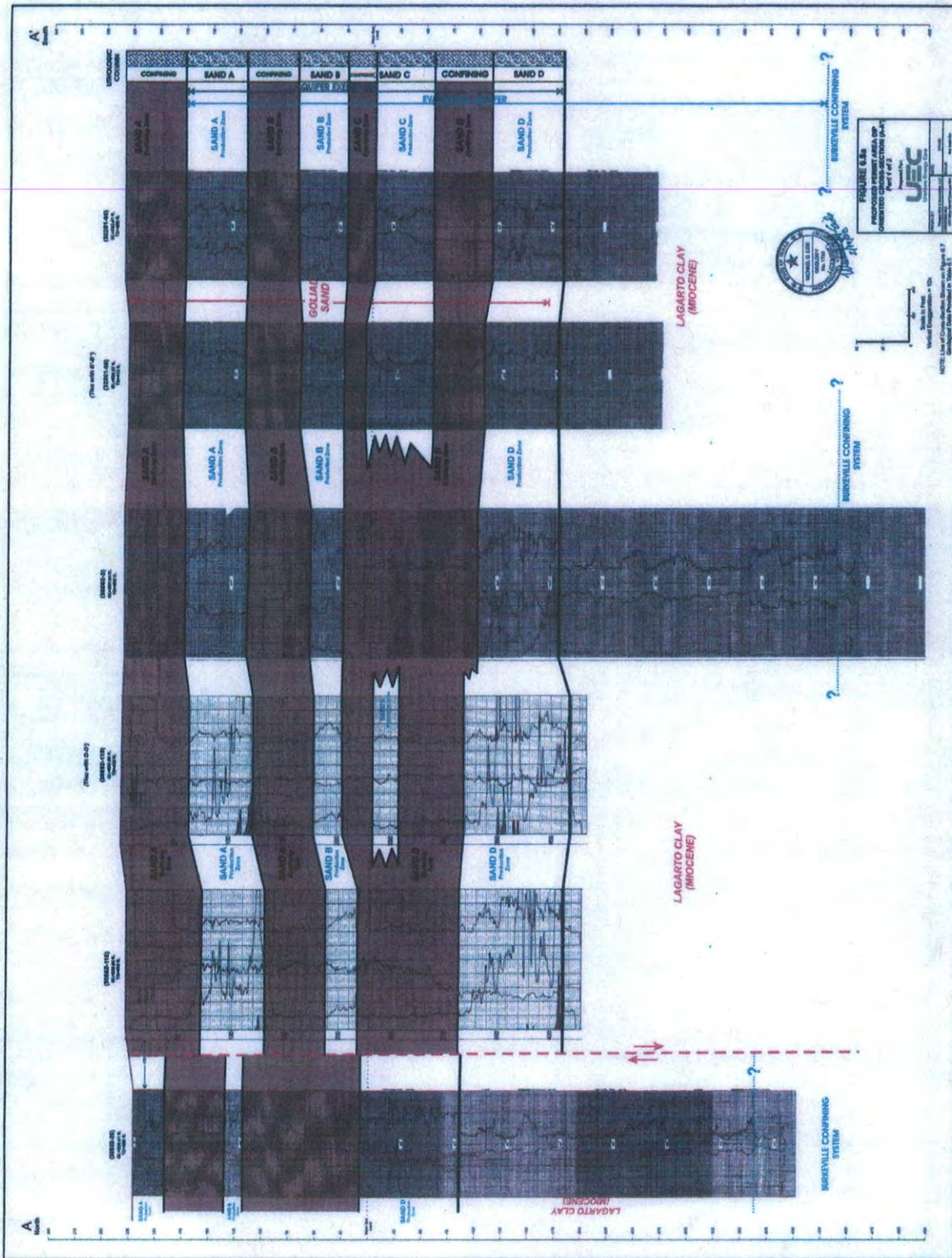
Figure 6.7 Cross-section Index Map

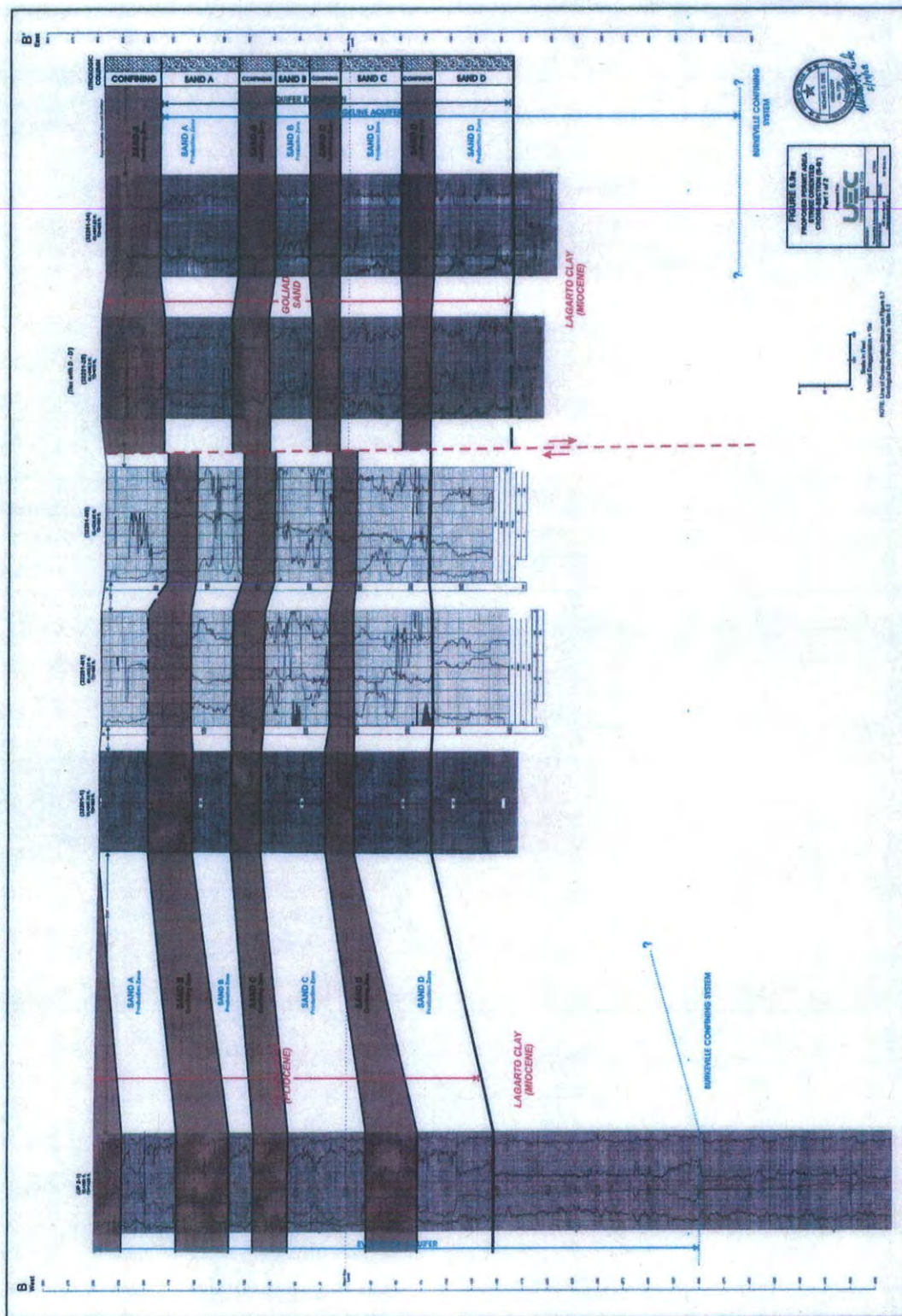


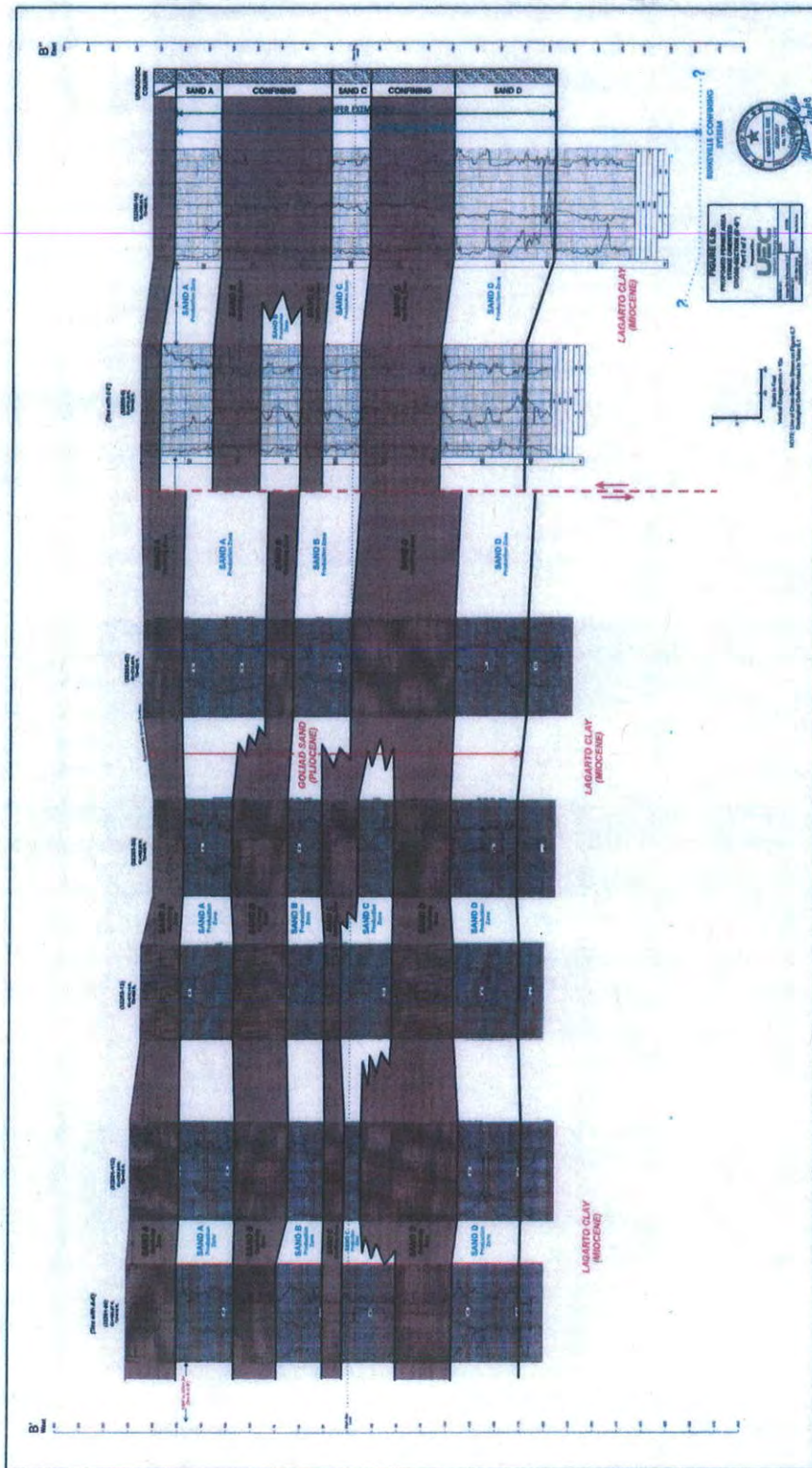
- Legend - Figure 6.7
- Borehole Locations
 - A Cross-Section
 - B Cross-Section
 - C Cross-Section
 - D Cross-Section
 - E Cross-Section
 - F Cross-Section
 - Permit Boundary

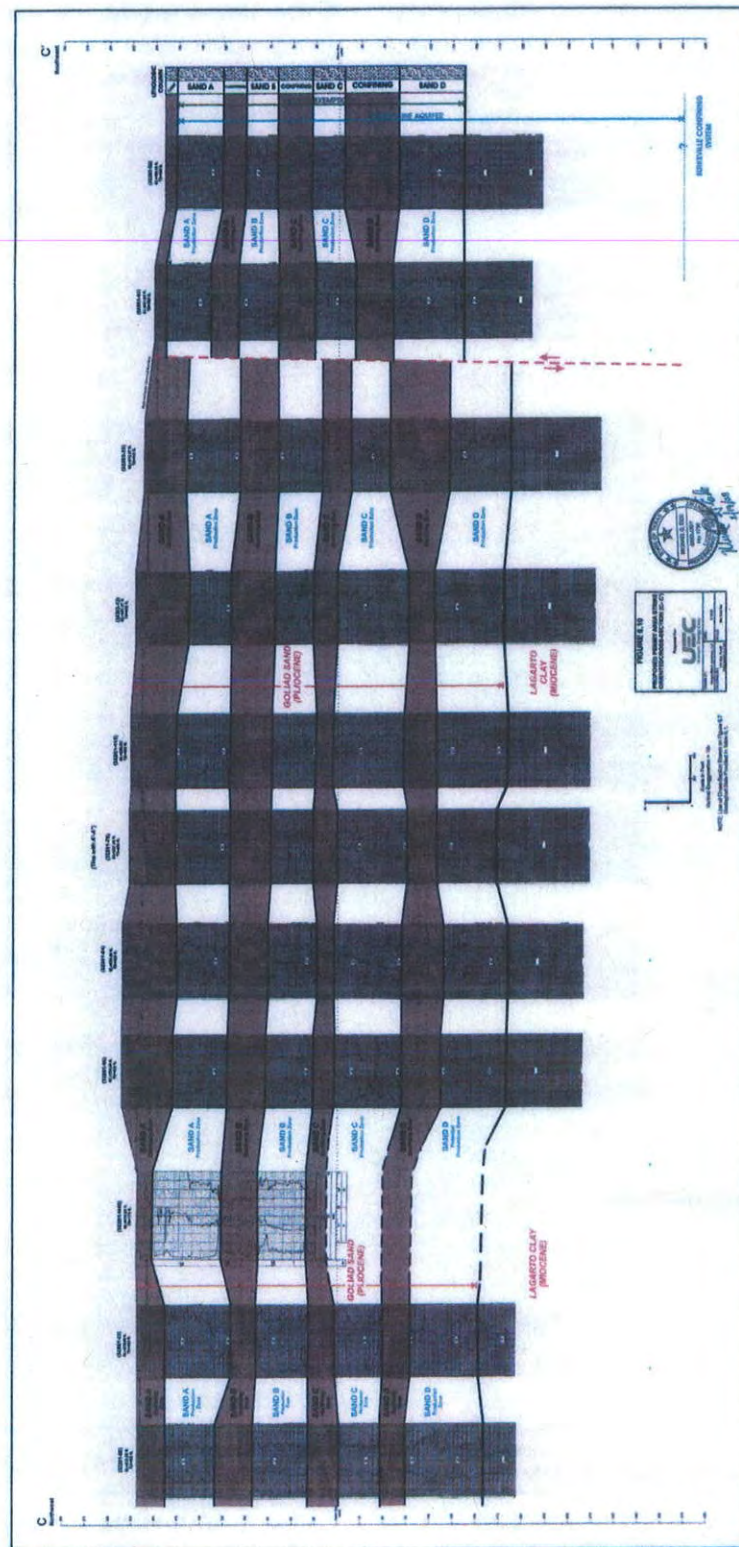


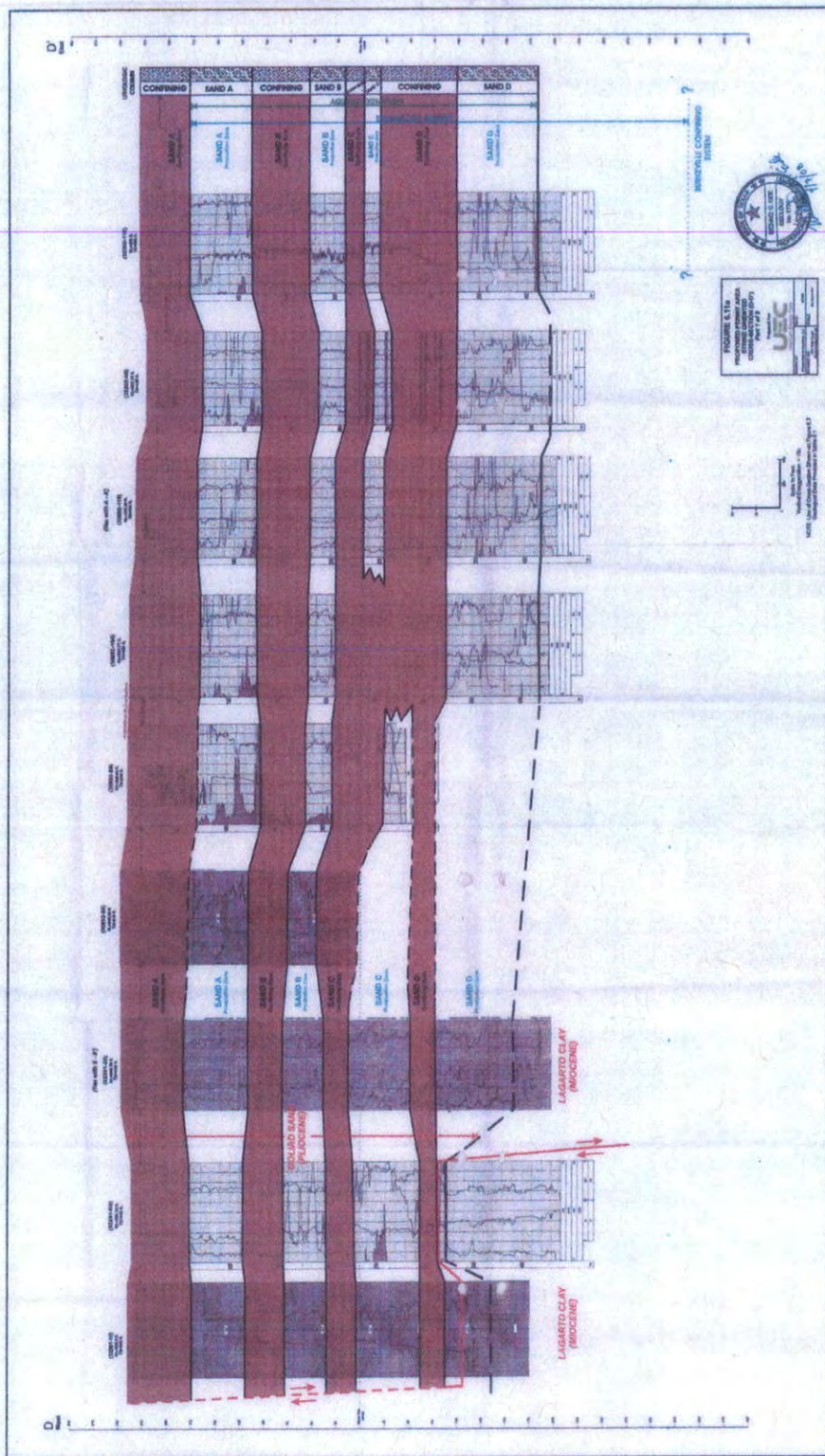
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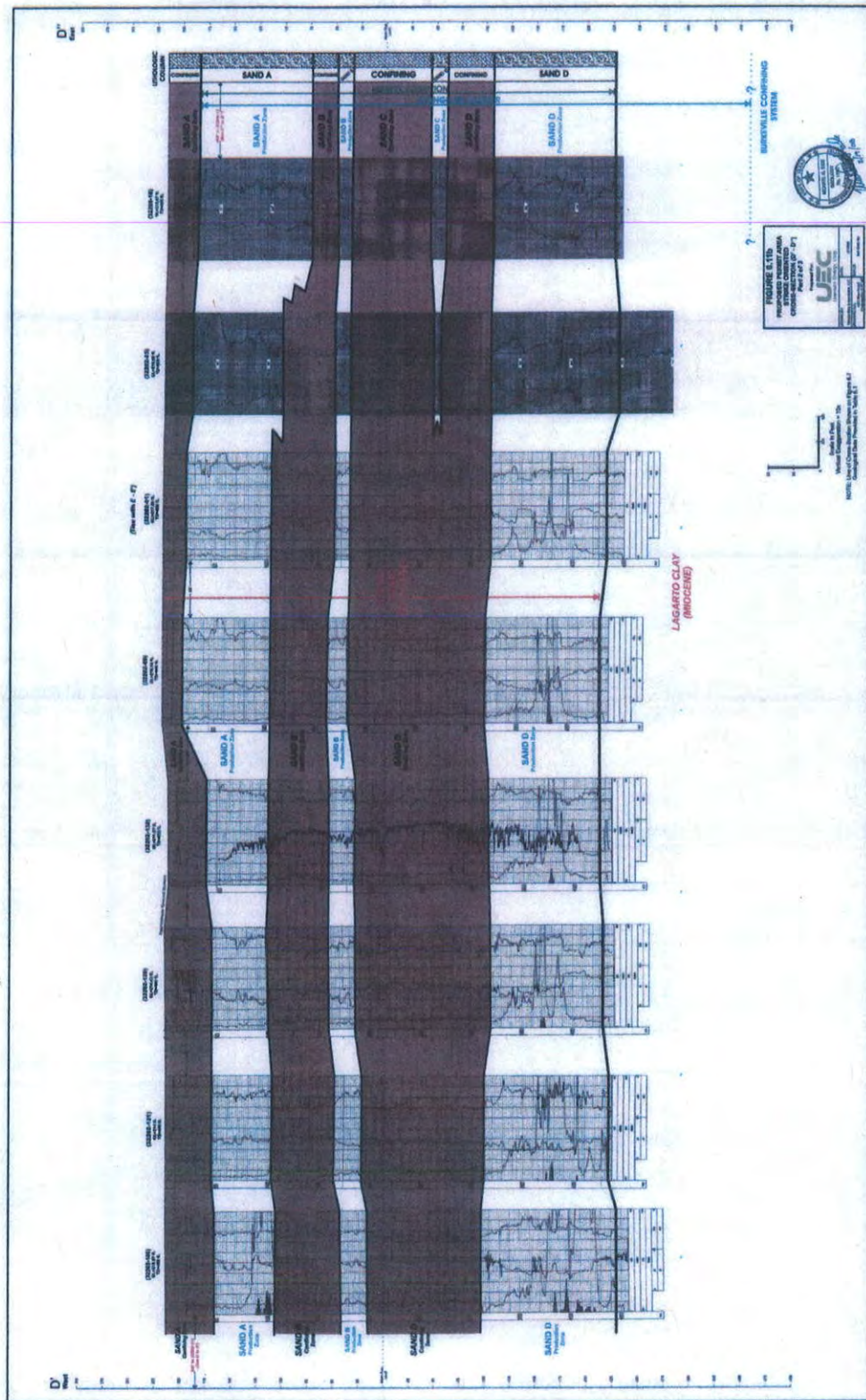


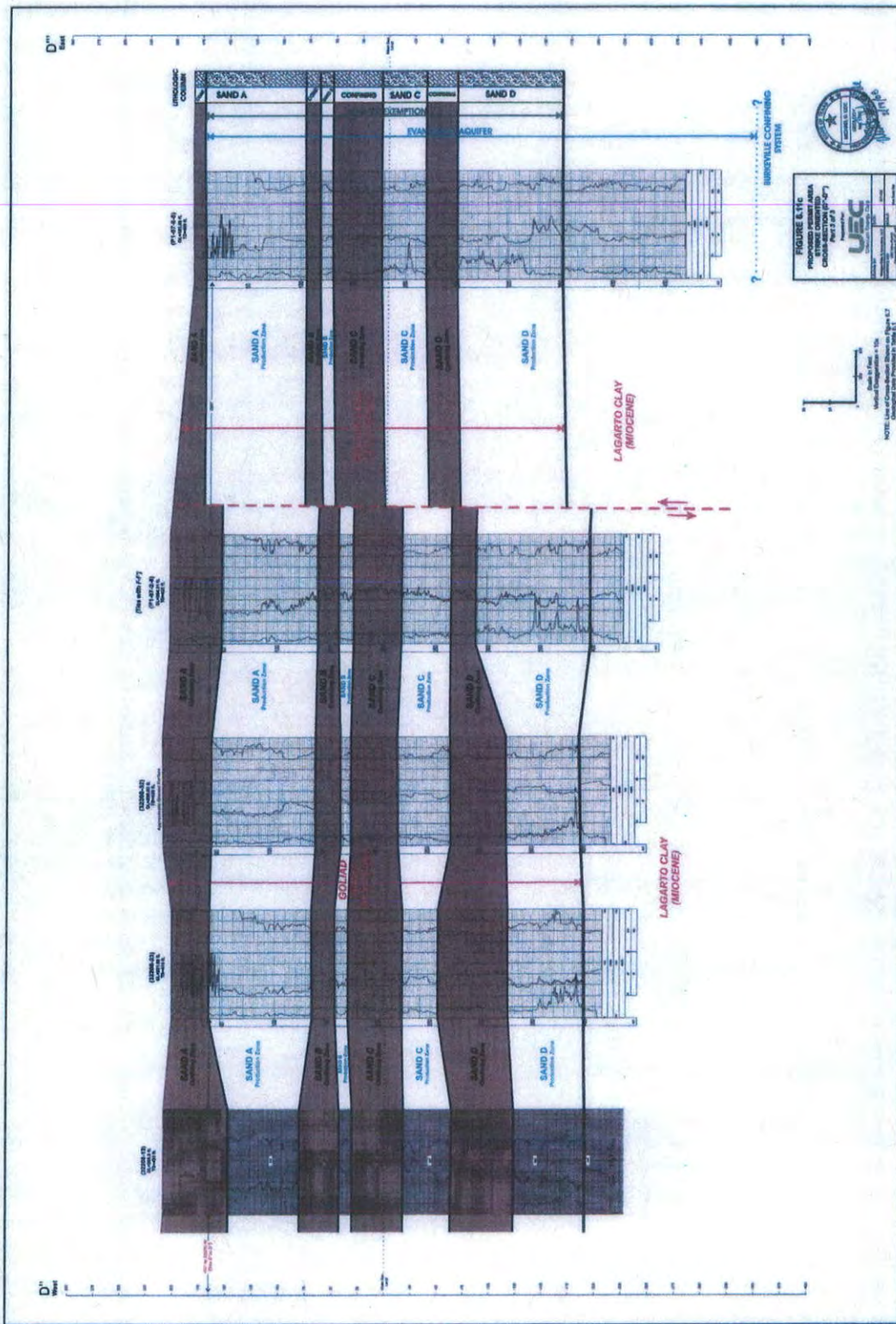


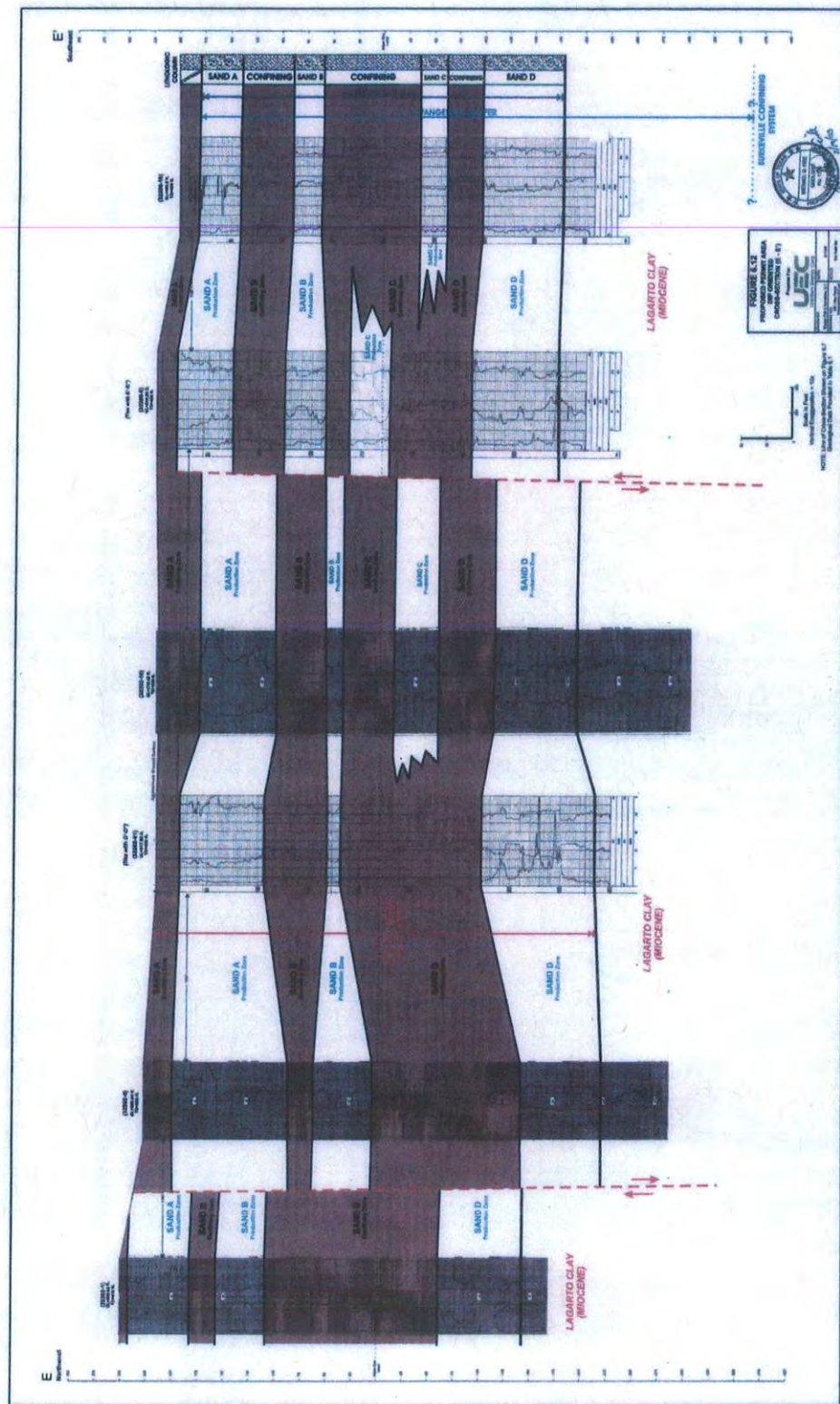


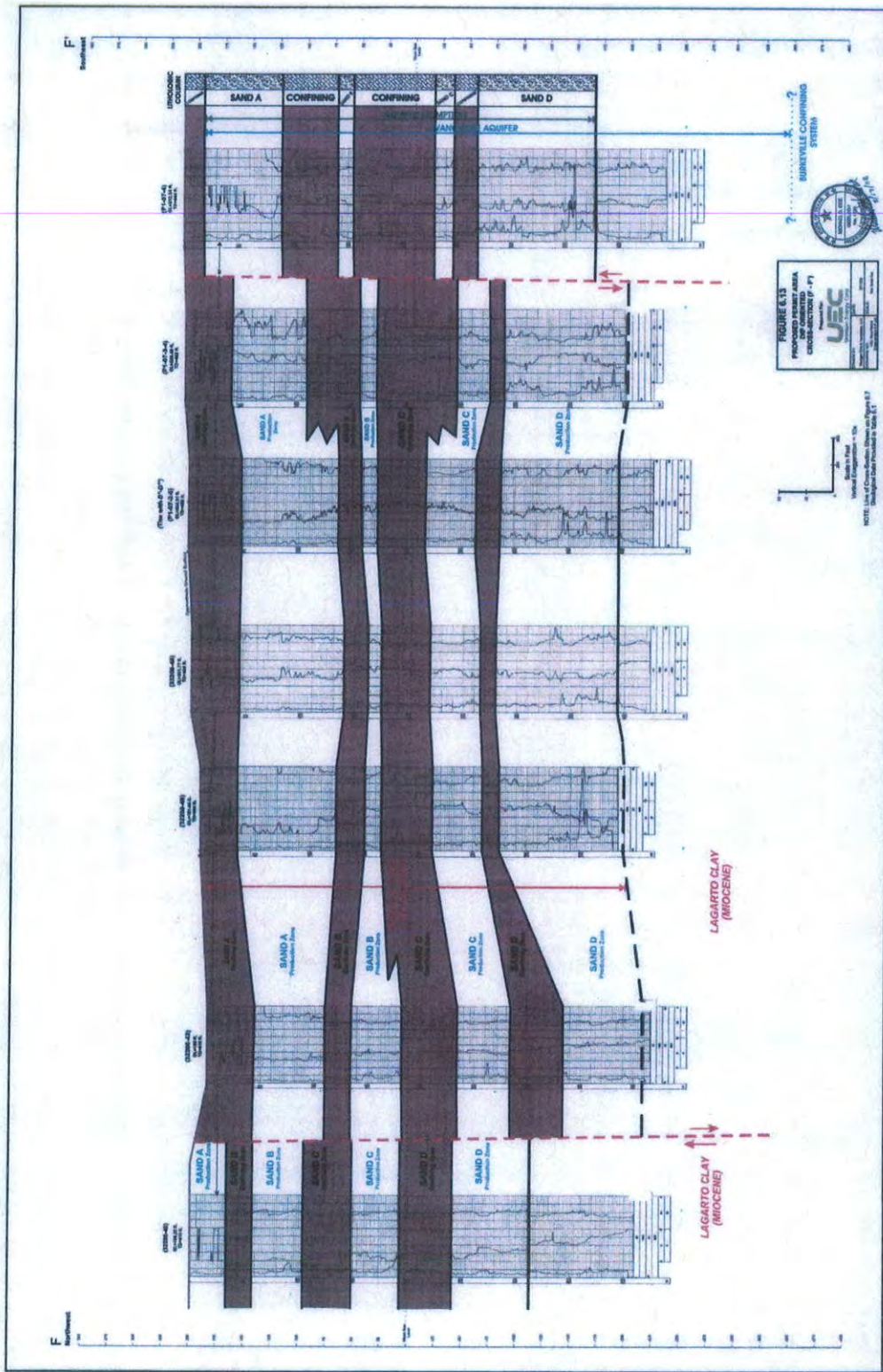














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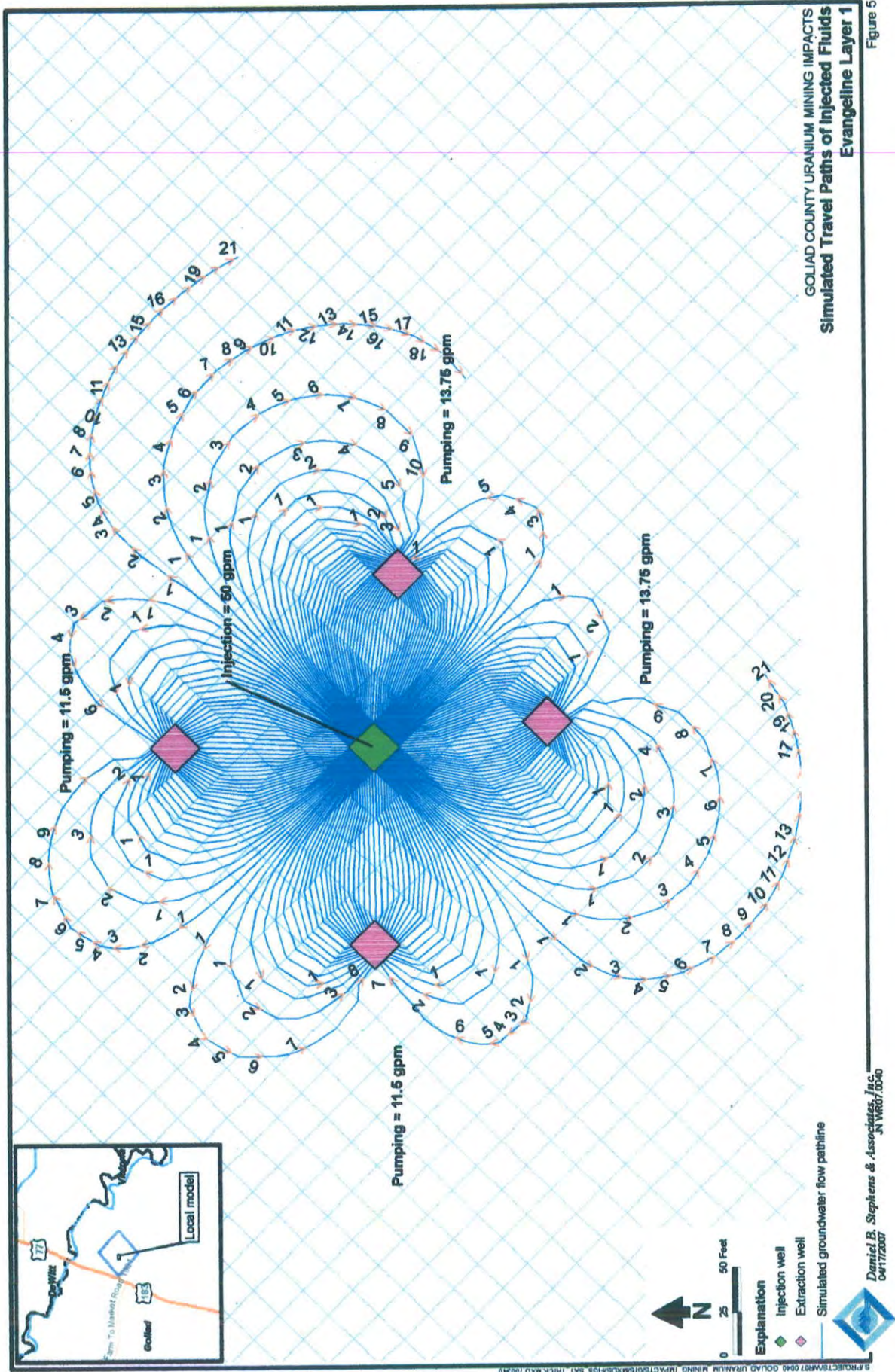
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Attached above is the table with the topics for discussion for our meeting on Thursday, August 16, 2012 from 1-2:30 p.m. I am still waiting to hear from Goliad County regarding finalization of their attendees. However, I have compiled a list of potential attendees at the bottom of this email for Goliad County. Once I get the final list of attendees from Goliad county, I will send you a separate email.

Lastly, these are the documents in electronic form from the presentation by GCGCD at the meeting with EPA on August 6, 2012.



4 wells and church with test results.xls Cross section Maps08022012_00000.pdf Simulated Travel Paths08032012_00000.pdf



UEC Pump Tests 08022012_00000.pdf Aug. 6, 2012 EPA Presentation.doc

Let me know if you have questions.

Thank you,

Stacey B. Dwyer, P.E.
Associate Director
Source Water Protection Branch
U.S. EPA Region 6
214-665-6729 phone
214-665-2191 fax

List of Confirmed Attendees

EPA

Sam Coleman- Acting Regional Administrator
Bill Honker- Acting Division Director, Water Quality
Wren Stenger- Acting Deputy Division Director, Water Quality
Stacey Dwyer- Associate Director, Source Water Protection Branch
David Gillespie- Assistant Regional Counsel
Philip Dellinger- Chief, UIC/GW Section
Ray Leissner- Engineer

Scott Ellinger- Hydrologist

TCEQ

Charles Maguire- Director, Radioactive Materials

UEC

Harry Anthony- Chief Operating Officer

Kennon Goldman- Counsel for UEC

Andy Barrett- Counsel for UEC

Van Kelly- Technical consultant

Craig Holmes - Technical consultant

Goliad County Groundwater Conservation District

Art Dohmann- President

Joe Kozielski- Vice President

Raulie Irvin- Board of Directors

Ernest Alaniz- Volunteer

Goliad County -awaiting final list of attendees

Jim Blackburn- Attorney (potential)

Adam Friedman- Attorney (potential)

Larry Dunbar- Attorney and Hydrologist (confirmed)

Ron Sass- Chemist (potential)

Test	Radium	RBLB 1,3,4,5 (PCi/I)	PTW 1-6 (PCi/I)	PTW 7-14 (PCi/I)	ALL WELLS (PCi/I)
First Test	Average	408	138	475	334
	High	1091	357	1684	1684
	Low	37	17	10	10
	Stand. Dev.	480	138	561	426
Second Test	Average	627	185	537	421
	High	1210	549	2000	2000
	Low	87	17	65	17
	Stand. Dev.	477	205	653	491
Third Test	Average	692	227	465	419
	High	1500	830	1590	1590
	Low	85	10	63	10
	Stand. Dev.	597	314	509	468

Test	Uranium	RBLB 1,3,4,5 (mg/l)	PTW 1-6 (mg/l)	PTW 7-14 (mg/l)	ALL WELLS (mg/l)
First Test	Average	0.052	0.021	0.218	0.115
	High	0.080	0.059	0.804	0.804
	Low	0.006	0.009	0.099	0.006
	Stand. Dev.	0.032	0.021	0.239	0.181
Second Test	Average	0.057	0.024	0.020	0.029
	High	0.150	0.090	0.019	0.150
	Low	0.004	0.003	0.005	0.003
	Stand. Dev.	0.069	0.034	0.021	0.040
Third Test	Average	0.007	0.003	0.005	0.005
	High	0.013	0.004	0.010	0.013
	Low	0.003	0.003	0.003	0.003
	Stand. Dev.	0.004	0.003	0.003	0.003



Topics of Discussion for Technical Goliad Aquifer Exemption Meeting

Stacey Dwyer to: Harry Anthony, charles.maguire, brent.wade 08/14/2012 11:25 AM
Cc: Andy Barrett, William Honker, Wren Stenger, Philip Dellinger, David Gillespie

From: Stacey Dwyer/R6/USEPA/US
To: Harry Anthony <hanthony@uraniumenergy.com>, charles.maguire@tceq.texas.gov, brent.wade@tceq.texas.gov
Cc: Andy Barrett <Andy@thebarrettfirm.com>, William Honker/R6/USEPA/US@EPA, Wren Stenger/R6/USEPA/US@EPA, Philip Dellinger/R6/USEPA/US@EPA, David Gillespie/R6/USEPA/US@EPA



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THE GOLIAD COUNTY GROUNDWATER CONSERVATION DISTRICT
PRESENTATION TO
THE ENVIRONMENTAL PROTECTION AGENCY
AUGUST 6, 2012

On November 6, 2001, Goliad County residents approved the formation of a Groundwater Conservation District, GCGCD. The purpose of the District is to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, in accordance with Chapter 36, State Water Code.

The Directors of GCGCD thank you for the opportunity to meet with you today to continue the dialogue in reference to the proposed uranium mining permit UR-03075 and the associated aquifer exemption.

With the issuance of the draft permit for public comment by TCEQ, many area residents and organizations responded with questions and comments. As noted in our previous letter, TCEQ issued 188 responses to approximately 350 comments. Today's meeting focuses on the protection of the drinking water for residents located in close proximity outside of the aquifer exemption boundary. In the TCEQ response #13, it states that "Individuals may protect their rights by contacting local law enforcement or seeking redress in a civil proceeding". GCGCD supports the position of the EPA that modeling should be done to provide a thorough technical analysis of the project. Protection through a civil proceeding is not a practical solution.

In reference to attachment 1, please note that there are a number of residences that ring the perimeter of the requested aquifer exemption. There are 18 residences and 1 church in the first segment, followed by many more expanding outward. A special note about the church is that it does not only function as a religious place but also as a community center. Many social activities such as birthday parties and family reunions are held at the church hall. GCGCD does not have the legal description of the aquifer exemption boundary, but by using to scale maps supplied with the permit application, the distance to these drinking water supply wells is approximately 1000 to 3000 feet.

In looking at directional migration of the groundwater in the area of the requested aquifer exemption, using the regional migration of groundwater from north-west to south-east only, may not be accurate. A review of the cross-sections provided in the permit application shows considerable variability in elevations and thickness of the aquifer sands. At the fault lines, there are vertical connections from one sand zone to another. The model presented by UEC during the contested case hearing also showed localized groundwater flow being somewhat vertical to the regional flow direction. The above data does not support a homogeneous flow pattern. There may be preferential flow patterns. This is further support for the request of doing a groundwater transport model.

A potential groundwater transport issue was discussed during the contested case hearing that can not be ignored. Evaluate an event where a landowner, located outside the aquifer exemption area, approached GCGCD for a permit to install a high production well such as an irrigation well. Abiding by the production limits set by the District and using the groundwater for a beneficial use, this potential permit would be issued. During the hearing, the modeler for UEC was asked about this hypothetical situation and he replied that "I would definitely not like to have pumping right in the near vicinity of my baseline monitoring wells". The discussion was about a hypothetical situation but there are a number of existing domestic and livestock supply wells that currently pump in the near vicinity that need to be fully integrated in a groundwater transport model.

I would like to spend a few minutes discussing several related water quality questions. What was the real before exploration water quality inside the aquifer exemption area? What are the real baseline values that should apply to restoration? With the acknowledgement by TCEQ that no previous uranium mining operation has completely restored water to baseline values, what should be done?

Of the 18 residences and 1 church noted in the first segment, GCGCD has been testing water quality of 4 of the residences and the 1 church for five years, see attachment 2. The constituents for the individual wells have shown very little variability.

Referring to attachment 3 a and b, these are the test results for the baseline and pump test wells located inside the aquifer exemption area. The first samples were taken in April 2008, the second in July 2009, and the third in November 2009. The first samples were taken shortly after the wells were completed in exploration borehole drilling was in progress. Please note that the uranium values were the highest in the first set of samples and 18 months later the uranium values had dropped and were now within drinking water standards. For the same wells and test dates, the radium values did not decline. What happened to cause this large variability?

Daniel B. Stephens & Associates provided expert hydrology testimony for GCGCD during the contested case hearing and had previously modeled a typical five spot uranium injection/extraction operation water flow diagram, attachment 4. GCGCD has contacted Daniel B. Stephens in reference to the modeling proposed by the EPA. They have provided a proposal to do an initial cost-effective analysis. This analysis will use currently available information concerning hydraulic gradient, hydraulic conductivity and effective porosity for the purpose of calculating straight line travel time migration values from the aquifer exemption area to the area water wells. This study will cost approximately \$9,000. GCGCD will consider providing this study if it will be used.